

## HAND PREFERENCE IN AN ITALIAN SAMPLE<sup>1</sup>

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*Summary.*—A hand-preference questionnaire was administered to 1694 Italian adults. Analysis indicates no relationship of sex and handedness and a percentage of 6.4 left-handers. The difference in percentage of left-handers across different populations is discussed in terms of cultural differences.

Previous studies on lateral preference, mainly those dedicated to evaluation of hand preference, have yielded some contrasting results on the percentages of left and right handers. Different estimates seem to depend both on various criteria used to define left or right lateral preference and on different populations examined. See a review by Porac and Coren (1981). When hand preference is evaluated on the basis of a questionnaire and a laterality quotient (LQ) is computed (Oldfield, 1971), the subject can be classified either left- or right-handed if his LQ falls inside predefined ranges. When the range varies from  $-100$  to  $+100$  and the criterion considers as left-handers subjects with  $LQ \leq 0$  and as right-handers subjects with  $LQ > 0$ , the average percentage of left-handers in the Anglo-Saxon population appears to be 11% (Levy, 1976; Porac & Coren, 1981). Obviously when a more stringent criterion is adopted this percentage drops to 3.5 (see Annett, 1967; Newcombe & Ratcliff, 1973).

Also, the sex of subjects may influence the percentage of left-handers since more men than women are sometimes reported to be left-handed. Oldfield (1971) reports 10% and 6% of left-handers in males and females, respectively. These percentages reach the values of 13.5 and 9.9% in Porac and Coren's study (1981).

The other point to be considered relates to the cultural influences on the incidence of left-handedness (see Table 1). According to the idea proposed by some authors (Dawson, 1977; Hardyck, Petrinovich, & Goldman, 1976; Levy, 1974, 1976) varying levels of permissiveness towards the use of the left hand in different cultures could be responsible for the difference in percentage of left handers found in different populations. A few studies seem to confirm this basic idea (Dawson, 1972, 1977; Hatta & Nakatsuka, 1976; Teng, Lee, & Chang, 1979; Verhaegen & Ntumba, 1964), indicating lower percentages of left handers in cultures characterized by a lack of permissiveness towards the use of the left hand.

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## METHOD

The subjects were 1,694 volunteers (733 females and 961 males) who ranged in age from 14 to 62 yr. and were mainly students. Most of the subjects (83%) were less than 24 yr. old. They were recruited from Universities and secondary schools. The Oldfield's questionnaire (Oldfield, 1971) of 10 items describing different motor activities was administered following the procedure suggested by Oldfield. Every subject was required to mark a "+" in the appropriate column (left or right) if the described activity was preferentially carried out using one hand, a "++" if, on the other hand, would never be used unless forced and a "+" in both columns in the case of real indifference about which hand to use. On the basis of the answers given, for each subject there was derived a laterality quotient by subtracting the number of "plus" signs in the left column from the number of "plus" signs in the right, dividing the obtained difference by the total number of "plus" signs and multiplying the results by 100. The laterality quotient varies from  $-100$  to  $+100$ ;  $-100$  indicates extreme left-handedness and  $+100$  extreme right-handedness.

## RESULTS

Grouping the subjects as left-handed ( $LQ \leq 0$ ) and right handed ( $LQ > 0$ ), the percentages of right and left handers are 93.6% and 6.4%, respectively.

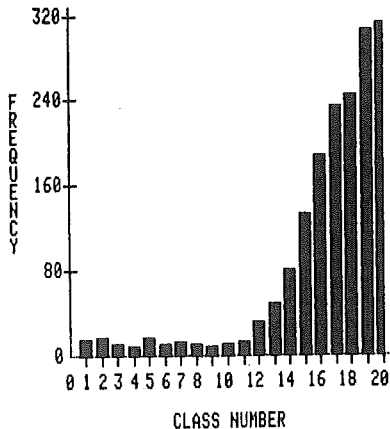


FIG. 1. Frequency distribution of hand preference as a function of Oldfield's LQ

No sex difference was found ( $\chi_1^2 = .693$ ). The frequency distribution of the laterality quotients for all the subjects is represented in Fig. 1. For convenience the range has been divided into 20 classes labelled from 1 to 20. To investigate the possible role of social pressure on handedness, an additional laterality quotient ( $LQ'$ ) based on eight activities only, writing and drawing being excluded, has been calculated. The mean values of  $LQ$  and  $LQ'$  were, respectively, 62.2 and 55.9. The percentage distributions of  $LQ$  and  $LQ'$  are reported in Table 2 and were significantly different ( $\chi_3^2 = 66.35$ ,  $p < .001$ ). The 0.001 confidence intervals for the percentage of left-handers in the population are 4.9% and 7.9%.

TABLE 1  
CROSS-CULTURAL COMPARISONS OF INCIDENCE OF LEFT-HANDERS

Society	Study	%
Western (U.S.A., U.K., Australia, Canada; children and adults)	Porac & Coren, 1981	11.8
Alaskan Eskimo	Dawson, 1972	11.3
Italian adults	This study	6.4
Chinese students	Teng, <i>et al.</i> , 1979	4.5
Temme (Sierra Leone adults)	Dawson, 1972	3.4
Japanese adults	Hatta & Nakatsuka, 1976	3.1
African children	Verhaegen & Ntumba, 1964	0.5

The results indicate that in the Italian sample there is a lower percentage (6.4%) of left-handed persons than in the Anglo-Saxon populations, but a higher percentage than in Oriental and African populations; see Table 1. Given that the confidence intervals for the percentage of left-handers in the Italian population are 4.9 and 7.9, it is likely that the difference in percentage of left-handers is not a sampling fluctuation. Genetic and cross-cultural factors can be invoked to explain this difference (Dawson, 1977; Porac & Coren, 1981). However, our data do not allow a test of an hypothesis on genetic factors. On the contrary, they allow considering the inference of cross-cultural factors such as the different degrees of pressure towards the use of the right hand in different cultures. Considering Table 2 it is apparent that the people are distributed differently on the LQ continuum, mainly in the positive half, according to the fact that their quotients are based on all 10 activities or on eight items only, writing and drawing being excluded. It is interesting to notice that, if we compare the percentage distribution A with B, there is a marked increase of percentage in distribution A in class 4 with a concurrent decrease in class 3, indicating a shift of subjects towards the right hand of the continuum for the laterality quotients. This marked reduction in the percentage of right handers in class 4 occurs only with the exclusion of writing and drawing, since exclusion of any other two items provides patterns of frequency distribution that can be different from the one provided by distribution A, but that are also

TABLE 2  
DISTRIBUTION OF PERCENTAGES OF SUBJECTS IN FOUR CLASSES OF LATERALITY  
QUOTIENT FOR DIFFERENT SELECTIONS OF ACTIVITIES

Class Interval	1 -100 < LQ < -50	2 -50 < LQ < 0	3 0 < LQ < 50	4 50 < LQ < 100
A: All the activities (LQ)	3.72	2.72	17.71	75.85
B: Writing and drawing are excluded (LQ')	3.72	3.78	28.86	63.64
		$\chi^2 = 66.35, p < .001$		

different from distribution B. If we consider that excluding writing and drawing the percentage of right-handers tends to decrease (92.5 instead of 93.6) and that social pressure is exercised mainly towards these two activities, we have to conclude that social pressure is one of the factors that has to be taken into account when handedness distributions for different populations are compared. The Italian society seems less permissive toward use of the left hand than Western societies and more permissive than Chinese or African ones.

The lack of a significant relationship of sex and handedness does not support Dawson's (1972, 1977) and Levy's (1974) hypothesis according to which cultural pressure for handedness acts more strongly for females than males. It does, however, agree with the results of a study conducted on a large sample of Italian children in which the relationship of sex and handedness was not found (Guaraldi, Ruggerini, & Bolzani, 1981) and with analogous findings of some investigations on Anglo-Saxon populations (Annett, 1967; Briggs & Nebes, 1975; Newcombe & Ratcliff, 1973).

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